INPLASY

Efficacy of Oral Myofunctional Therapy (OMFT) in Increasing Tongue and Lip Strength in OSA Patients - Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - NIL.

Review Stage at time of this submission - Completed but not published.

Conflicts of interest - None declared.

INPLASY registration number: INPLASY202510070

Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 19 January 2025 and was last updated on 19 January 2025.

INTRODUCTION

Review question / Objective Oral myofunctional therapy (OMFT) has been used as one of the treatment methods to address upper airway muscle strength and endurance to improve obstructive sleep apnoea (OSA). However, there has been a lack of objective evidence in the literature for the treatment of OSA. This study aims to address this by performing a systematic review and meta-analysis on the effect of OMFT on the upper airway musculature in OSA patients.

Rationale Few studies have looked specifically into the objective measurements of how oral myofunctional therapy (OMFT) alters the upper airway musculature in OSA patients, and what this may translate to in the treatment of OSA. This study aims to gather the evidence available to look at the improvement of upper airway musculature strength pre-OMFT and post-OMFT.

Condition being studied The condition being studies is Obstructive Sleep Apnoea, with OMFT being one of the treatment options.

METHODS

Search strategy We searched databases Medline, Embase, Cochrane Central Register of Controlled Trials, and Web of Science from 1 January 1990 to 30 March 2023 in accordance with Cochrane Handbook guidelines. It was initially piloted in Medline using medical subject headings (MeSH) and refined using key articles found in preliminary searches. The Medline (Ovid interface) search strategy was consistent across all databases. Strategic search terms included myofunctional therapy/breathing exercise/orofacial myotherapies, sleep apnoea/sleep hypopnoea, tongue pressure, tongue strength, Iowa Oral Performance Instrument (IOPI). The literature search was conducted on 30 March 2023 via Medline, Embase, and Cochrane Central Register of Controlled Trials, in accordance with Cochrane

Handbook guidelines. It was initially piloted in Medline using medical subject headings (MeSH) and refined using key articles found in preliminary searches. The Medline (Ovid interface) search strategy was consistent across all databases. Strategic search terms included myofunctional therapy/breathing exercise/orofacial myotherapies, sleep apnoea/sleep hypopnoea, tongue pressure, tongue strength, Iowa Oral Performance Instrument (IOPI).

Participant or population Adult patients >18 years old, who have diagnosed obstructive sleep apnoea (quantified as Apnoea Hypopnea Index (AHI) or Respiratory Disturbance Index ≥ 5. Patients who had neuromuscular disease were excluded from the study.

Intervention Patient underwent oral myofunctional therapy (OMFT) for the duration of treatment.

Comparator The comparator consisted of the measurement of patient's tongue or pharyngeal muscle strength prior to any myofunctional therapy.

Study designs to be included All study designs including mixed methods research, randomised controlled trials, quasi-experimental studies, cohort studies, case-control studies, cross-sectional studies, and descriptive papers published between 1 January 1990 – 30 March 2023 were included.

Eligibility criteria Studies containing elements of the Population intervention Comparator Outcome (PICO) format were searched. All study designs including mixed methods research, randomised controlled trials, quasi-experimental studies, cohort studies, case-control studies, cross-sectional studies, and descriptive papers published between 1 January 1990 – 30 March 2023 were included. Only studies that included an objective measurement of upper airway musculature pre-OMFT and post-OMFT in patients with OSA were selected to be included in this review.

Information sources We searched databases Medline, Embase, Cochrane Central Register of Controlled Trials, and Web of Science from 1 January 1990 to 30 March 2023 in accordance with Cochrane Handbook guidelines.

Main outcome(s) For the systematic review, we studied the outcome measures including tongue strength, tongue endurance, and lip strength. These measures are obtained using the Iowa Oral Performance Instrument (IOPI). The IOPI is a device that allows for objective measurements of tongue and lip strength using an air-filled bulb with the patient's tongue or lips pressing against it to provide a pressure measurement, computed in kilopascals (kPa).

Additional outcome(s) Additional outcomes included Apnea Hypopnea Index, Oxygen Desaturation Index, Minimum Oxygen Saturation levels, Epworth Sleepiness Scale and Pittsburgh Sleep Quality Index.

Data management Studies were first screened by title and abstract, with only PICO elements, and subsequently screened by full text where the eligibility criteria were applied. The screening process was carried out by two independent reviewers. Conflicts were resolved by a third independent reviewer and thorough discussion. Neither of the reviewers were blinded to journal titles, study authors, or institutions. Data was extracted using a standardised form on Microsoft Excel (Microsoft, USA). We emailed authors of studies that met the inclusion criteria whom did not provide a detailed breakdown, or if there were any queries in the data of the outcome measures. These studies are included if data was provided. Differences in the data extracted were resolved through discussion.

Quality assessment / Risk of bias analysis We assessed the risk of bias (RoB) using the JBI critical appraisal tool for randomised controlled trials and quasi-experimental appraisal forms from two observers. Any discrepancy was discussed and a consensus was made after the discussion (see Supplementary Material). Egger's regression would be conducted to detect publication bias if there were 10 or more studies.

Strategy of data synthesis Mean Difference between the pre-and post-OMFT was used as the effect measure for tongue strength, tongue endurance, tongue peak pressure, lip strength and sleep study indices. These were extracted or computed from the available data. Subsequently, the standard error of the MD was extracted from the articles or computed based on the 95% CI or the p-values.

Subgroup analysis Forest plot was used to demonstrate the Mean difference IV, Random, 9% % CI between papers for each outcome measurements as stated above.

Sensitivity analysis Heterogeneity of each were also calculated and included in the results.

Language restriction English.

Country(ies) involved Singapore.

Keywords Obstructive Sleep Apnoea/Obstructive Sleep Apnea; Oral myofunctional therapy; Tongue exercise; Iowa Oral Performance Instrument (IOPI).

Contributions of each author

Author 1 - SU ANN LIM - The author organised the study, determined the study objectives, methods, study design, performed the screening and selection of studies, writing of manuscript and submission of paper.
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